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**A FISHERIES, WILDLIFE AND HABITAT MANAGEMENT PLAN FOR WISCONSIN  
[2001 through 2007] (June 2000 version)**

**PURPOSE:**

This document address the DNR Mission, implements the 4 goals of the Department's Strategic Plan, and provides specific information and objectives relevant to fish, wildlife, and habitat management for the six year period from July 1, 2001 through June 30, 2007. The Department's authority to manage fish and wildlife populations are found in State Statute 29.011 and 29.014. There are additional specific authorizations throughout Chapters 29 and 23. Administrative rules affecting Fish and Wildlife are found in NR 10 (game) and NR 20 - 26 (fishing). Additional authorizations are found in NR 10 through NR 27 and NR 45. Chapters 30 and 31 of the statutes protect aquatic habitat. This information and the DNR Strategic Plan can be accessed electronically through the DNR web site.

***The lead DNR programs that fund each objective are indicated by their abbreviation.***

**GOALS AND OBJECTIVES:**

**I. MAKING PEOPLE OUR STRENGTH**

**A. Internal Staff -- Ensure technical competency**

1. By 2001, develop and provide not less than 40 hours of technical training per year for current staff in each subprogram. [FH, WM, LE]
2. By 2001, develop and implement an orientation program of not less than 320 hours for new biologists, technicians and managers during their first year. [FH, WM, LE, ER]
3. Hold an annual statewide technical training workshop for fisheries and habitat, law enforcement, wildlife, and endangered resources. [FH, WM, LE, ER]

**B. Partners and the Public**

1. Wardens, fisheries and wildlife biologists and other staff, involve partners and communities in identifying and solving issues affecting fish, wildlife, endangered resources, and habitat. they resolve user conflicts within each GMU through increased contact with land owners, and community-based action. [LE, FH, WM, ER]
2. Print one or more fish, wildlife, or habitat related success story about a major project in each GMU's local press every year. [FH, WM]
3. Report fish, wildlife, and endangered resources accomplishments, innovations, highlights, and costs to the public and legislature annually. [FH, LE, WM, ER]
4. By 2002, package and market existing fisheries and wildlife outdoor skills and awareness programs to schools and youth development agencies. Wherever practical, correlate programs to the Department of Public Instruction's Model Academic standards to encourage interdisciplinary use by upper elementary and middle school use. Modify programs where necessary to address the different needs of different target audiences. Offer fish and wildlife programs in conjunction with other complimentary, department education programs. Supplement with highlights of local education efforts developed by Department biologists and wardens beginning in 2002 [FH, WM, LE]

5. By 2002, in partnership with the Wisconsin Department of Tourism, private industry, the American Sport-Fishing Association, and other partners promote the responsible use and enjoyment of natural resources on a sustainable basis. With industry support, maintain the tackle loaner program at 25 DNR sites and increase it with help from partners, communities, organizations, and industry. [FH]
6. Increase available information for sport fish including muskellunge, walleye, bass, salmon and trout to inform anglers about the status and management of their fisheries through on-line and printed information services by 2002. [FH]
7. Promote safe, responsible and ethical conduct to all existing hunters through improved communications in the media and department publications each year. [LE]
8. Hunter Education Program – Recruit, train, and retain the volunteer instructor corps to certify the increasing number of new hunters. [LE]
9. Trapper Education Program - improve our curriculum in cooperation with WTA. Improve support materials for the program. [LE]
10. Improve and conduct an annual standardized training workshop for all hunter education instructors. [LE]
11. Develop specialized training for lead hunter education instructors to meet the goal of consistent delivery of the basic education course by 2001. [LE]
12. Train new hunters and instill in them the attitude to always exercise safe and responsible conduct each year. [LE]
13. Develop partnerships for the management of public shooting ranges and provide a minimum of 3 ranges for 3 counties each year. [LE]
14. Develop data sharing agreements with local units of government involved in land use planning and help them apply the data to local decisions. [ER, ISS]
15. Work with private landowners to develop cooperative agreements for stewardship of rare plants on private lands. [ER]
16. Participate in the eco-regional planning efforts of The Nature Conservancy and other efforts of private conservation organizations to identify biodiversity protection targets. [ER]
17. Encourage partners to devote money and staff toward accomplishing our education objectives. [WM]

## **II. SUSTAINING ECOSYSTEMS**

### **A. General Goals and Objectives**

1. Manage for a biologically diverse, balanced, and healthy ecosystem that meets fishable and swimmable standards and the DNR's strategic objectives for biodiversity. [FH, WM, ER]
2. Implement the monitoring strategy in each GMU in 2001 and continue developing bio-criteria, habitat indices, and supporting databases for aquatic systems through 2007. [FH,ISS]
3. Identify and protect critical habitat in each GMU through the basin planning and monitoring processes in concert with local citizens and partners. [FH, WM, ER]
4. Identify and investigate the causes of habitat loss or impairment and take corrective actions in each GMU. [FH, WM]
5. Remove 30 to 50 dams and improve the associated stream habitat by 2007, where sport fisheries and aquatic diversity can be improved and the local communities are willing partners. Identify candidate sites in basin plans with priority placed on removals that create long stretches of stream habitat [FH requires additional funding 2001-03 budget].
6. By 2005, revise or develop management guidelines and hand-book practices for the major sport fisheries of Wisconsin including habitat restoration and management of lakes and streams, stocking, and species or community plans for major sport species. [FH]
7. Screen proposed management actions for impact on state and federally listed species; develop improved tools for screening and for managing rare species and natural communities. [ER]
8. Protect waters and shoreline habitat through enforcement of state statutes and rules. Utilize enforcement mechanisms for habitat restoration. [FH, LE]
9. Ensure that species are protected from exploitation caused by unregulated commercialization and other unlawful activities. [LE]
10. Develop and improve the capacity to use the Aquatic and Terrestrial Resource Inventory (ATRI) system, and to search and download Natural Heritage Inventory (NHI) information and data on the internet to support land use and management decisions. [ER, ISS]
11. Identify opportunities to protect, enhance or restore threatened ecosystems through the Acquisition 2050 Plan [LF, WM].
12. Identify and implement strategies to buffer the effects of rural residential development adjacent to critical habitat [WM].
13. Continue to educate staff on the necessity of prescribed burning and the safe use of this technique. Continue to educate the public on the importance of prescribed burning to ecological management [WM].

## **B. Aquatic Communities**

### **1. Cold Water Streams [FH]**

- 1.1. Prevent any further loss of habitat including water quality or quantity in cold water streams through regulatory, watershed management, and land acquisition programs.
- 1.2. By 2001, update the list of classified trout streams to be used by regulatory programs, and merge it with the NR 104 water quality standards classification list by 2003.
- 1.3. By 2001, increase intensive habitat restoration from 20 miles to 25 miles of trout stream per year and maintain past habitat development, while protecting and enhancing habitat for non-game, threatened or endangered species.
- 1.4. Keep high priority trout streams free of beaver dams consistent with the beaver control policy. [WM, FH]
- 1.5. By 2002, update and gain approval for a revised environmental assessment for habitat development.
- 1.6. Restore naturally reproducing native brook trout and the associated native cold water community in 4 streams statewide per year.
- 1.7. Inventory the biota of spring-heads statewide. [Requires new ER funding]
- 1.8. Support and further promote Forestry Best Management Practices for water quality [WM, FR].

### **2. Warm water Rivers and Streams [FH]**

- 2.1. Assess 25 to 50 sites in warm water rivers and streams each biennium using the aquatic monitoring strategy.
- 2.2. Assess the impact of 10 dams or hydro facilities per year statewide.
- 2.3. Characterize the fish, mussel, and aquatic insect community in 5 sites per GMU in critical river and stream habitats on an annual basis. [ER, FH]
- 2.4. Rehabilitate 500 to 700 acres of Mississippi River habitat each year using the Environmental Management Program.
- 2.5. Evaluate and report the impact of harvest and regulations on sport fish in large river populations by 2007.
- 2.6. By 2002, identify critical habitat sites in each basin plan for stream bank protection or in-stream habitat restoration to enhance sport fisheries in each GMU.
- 2.7. Implement the Northern Rivers Strategy (NOR).

### 3. Lakes [FH]

- 3.1. Identify and protect critical spawning, reproductive, and nursery habitat in Wisconsin lakes with major sport fisheries within each GMU.
- 3.2. Identify and protect critical habitat for endangered or threatened species within each GMU. [ER, FH]
- 3.3. Develop criteria to identify and recommendations protect existing self-sustained fisheries. Include the recommendations in the basin plans.
- 3.4. By 2007, evaluate current and new habitat restoration techniques and incorporate results into the FH handbooks.
- 3.5. Continue to work with local units of government to further protect shore lands [WT, FH, WM].

### 4. Great Lakes [FH]

- 4.1. Revise the Lake Michigan Integrated Fishery Management Plan and gain stakeholder approval for it by 2002.
- 4.2. For Lake Michigan, in cooperation with other jurisdictions develop lake-wide salmon stocking strategies that are ecologically sustainable and well accepted by the sport fishing public.
- 4.3. Develop and implement a model and data collection program to provide estimates of lake-wide abundance of Lake Michigan yellow perch, in cooperation with other jurisdictions.
- 4.4. Complete the Lake Superior GMU basin plan and include sport and commercial fishery objectives by 2002.
- 4.5. Develop and implement an improved lake trout population model for Lake Superior, in cooperation with other jurisdictions.
- 4.6. Implement appropriate management actions consistent with brook trout, lake sturgeon, and walleye rehabilitation plans developed by the Lake Superior Committee.

### 5. Wetlands (see Wetlands Strategy)

- 5.1. Implement "Reversing the Loss: A strategy for protecting and restoring wetlands in Wisconsin". [FH, WM, ER]
- 5.2. Identify and prioritize wetlands in need of protection, restoration and enhancement in the basin plans. [FH, WM, ER]
- 5.3. Seek authority for and develop a comprehensive state administered wetland regulatory and enforcement program including compensatory mitigation for permitted wetland loss. [FH, LE, WM]

- 5.4. Protect wetland complexes with exceptionally high value through acquisition, incentives and other innovative strategies by federal, state and local government and not-for-profit conservation organizations. [LF, FH, WM, ER]
  - 5.5. Restore degraded wetland complexes on public and private lands to recapture ecosystem function and value and in certain areas enhance migratory waterfowl habitat. [WM, ER]
  - 5.6. Develop and begin testing tools to assess wetland biotic integrity by 2003. [ISS, FH]
  - 5.7. Increase the use and accessibility of Wisconsin's Wetland Inventory (W.W.I) for a full range of planning, policy, management, and regulatory applications by overcoming technical barriers to GIS applications and by updating the inventory on a more frequent basis. [FH, ISS]
- C. **Terrestrial Ecosystem** [Note: The forest related goals in this plan require discussion and reconciliation with the Forestry Division through their statewide Forest Planning process]
1. Oak Pine Barrens [WM, ER]
    - 1.1. Maintain and restore barrens communities through partnerships with multiple landowners.
      - 1.1.1. Implement the Northwest Sands Integrated Ecosystem Management Plan in concert with the signatory partners.
      - 1.1.2. Develop multi-agency and cranberry grower plan for Central Wisconsin by 2006.
    - 1.2. Data, maps and opportunities for restoration of this community identified.
      - 1.2.1. Ecosystem Management Team produces maps and data by June 30, 2000.
      - 1.2.2. Field managers identify restoration opportunities by December 31, 2000, in basin
  2. Southern Forests [WM, ER]
    - 2.1. Protect, enhance and maintain remaining large block southern forest landscapes (kettles, Baraboo hills, driftless area, Mississippi River, Wisconsin River).
    - 2.2. Complete by December 31, 2006 on-going land planning efforts, e.g., the Kettle Moraine Feasibility Study, the SE Region Natural Areas Feasibility Study, and the 2050 Land Acquisition Study. [LF]
    - 2.3. Identify priority Southern Forest restoration areas and use available dollars (i.e., Turkey Stamp, Farm Bill, CREP) to enlarge and connect them. By December 31, 2006, each basin will identify its restoration areas, 5,000 acres will be restored and a record keeping system will be built to track progress on the objective.

- 2.4. Complete development of the ATRI framework to link and identify relationships between species and DNR land classification systems (NHI, Forest Assessments, Wetland Inventory, Kotar). Standardized data fields among databases that are developed and in use by December 31, 2006. An inventory clearinghouse is created. [ER, ISS]
- 2.5. Promote management practices to benefit and enhance native flora and fauna associations, in particular interior forest birds, deer, and oak trees. [ER]
  - 2.5.1. By 2007, 98% of deer management units are at goal. [WM]
    - 2.5.1.1. An oak ecosystem study is started. [ER]
    - 2.5.1.2. Develop and implement a Wisconsin's bird conservation initiative. [ER, WM]
3. Grasslands
  - 3.1. Implement recommendations for this community found in the Biodiversity Report and the Management for Grassland Birds document. [WM, ER]
  - 3.2. Manage, enhance and restore native prairie remnants as refugia for flora, fauna and ecological processes. [WM, ER]
  - 3.3. Protect and manage 500 acres of remnant prairie not currently afforded management or protection. [WM, ER]
    - 3.3.1. Protect and manage 1,000 acres of sedge meadow not currently afforded management or protection.
4. Oak Savannah [WM, ER]
  - 4.1. Establish savanna habitat at several landscape scales to meet area requirements for a wide range of species.
  - 4.2. Work with partners to restore 1,000 acres of degraded oak savanna on private land by December 31, 2006.
  - 4.3. Initiate oak savanna across its historical range restoration on 3-4 Department-owned properties by December 31, 2006.
5. Northern Forest [WM, ER]
  - 5.1. Maintain full spectrum of forest ecosystems with range of successional stages, patch sizes, geographic distribution, involving public and private partners. Continue to incorporate wildlife needs through the private tax law. [Requires discussion with FR].
  - 5.2. Complete master plans and 10-year plans as scheduled during this six-year period [LF].
  - 5.3. Maintain large, contiguous forests for ecological, economic and social reasons.

5.4. Identify forest ownerships of 1,000 acres or more and plan for those parcels to remain forested. [Requires discussion with Forestry].

5.5. Restore under-represented elements of Northern Forests (e.g. flora, fauna, forest structure and ecological processes).

5.5.1.Recovery & management plans for species are completed as scheduled. [ER]

5.5.2.Implement Flight Area 20 Plan.

**D. Species of Special Concern** [Additional funding requested by ER]

1. Non-Game Mammals

1.1. Monitor Wisconsin's wolf population, and implement the provisions of the Wolf Management plan approved by the Natural Resources Board in 1999. [ER, WM]

1.2. Assess location, population characteristics, and movements of bats along the Niagara Escarpment. [ER]

1.3. Incorporate small mammal inventories into master planning inventories and other inventories on public lands. [ER]

1.4. Manage state properties for balanced plan and animal communities [WM].

2. Non-Game Birds [ER, WM]

2.1. Continue eagle and osprey population monitoring and productivity surveys.

2.2. Continue population monitoring and productivity surveys for trumpeter swans; update and revise recovery plan to incorporate new downlisting and delisting goals, which will be based on population viability mode3l, due from ISS in October 2000.

2.3. Develop and implement Partners in Flight Plans for migratory Songbirds for Areas 16 and 20 Plans. Participate in planning efforts to determine the staff and resource costs for implementing the PIF plans, and develop approaches for meeting those needs.

2.4. Revise and update peregrine falcon recovery plan; continue recovery activities.

2.5. Integrate shorebird management into management of wildlife impoundments, and develop other initiatives as opportunities present themselves in the Wisconsin Bird Initiative.

2.6. Continue population monitoring and management efforts for colonial waterbirds (herons, gulls, terns, cormorants, egrets, piping plover).

2.7. Develop and implement statewide population monitoring and management program for marsh/wetland birds that allows us to track and monitor populations.

2.8. Coordinate efforts with ISS to implement landscape scale management efforts for grassland birds.

2.9. Participate as a partner in further development of the Wisconsin Bird Conservation Initiative, and implement the specific goals and objectives established in that plan.

- 2.10. Serve as a partner in the recovery of Whooping Cranes. Work with the USFWS, International Crane Foundation, and others on the assessment, planning, and implementation of a project to reintroduce a migratory flock of whooping cranes to Wisconsin. Target dates for the project are spring 2000 for a trial migration with Sandhill Cranes and spring 2001 for the first release of whoopers.
- 2.11. Develop and implement management guidelines for habitats supporting forest raptors.
- 2.12. Participate in studies to determine status of the northern goshawk; contribute nesting data to the NHI database.
3. Herptiles [ER, WM]
  - 3.1. Participate in Partners for Amphibian and Reptile Conservation (PARCS) planning and implementation.
  - 3.2. Monitor population status of rare snake species.
  - 3.3. Assist the USFWS in developing and implementing the Massasauga Rattlesnake conservation plan.
4. Fish [FH]
  - 4.1. Sturgeon: Gain approval and implement statewide Sturgeon management Plan by 2002. Preserve and enhance existing naturally reproducing populations. Re-establish populations in waters within their original range consistent with their genetic origins.
  - 4.2. Lake Trout: Update the lake-wide lake trout restoration plan for Lake Michigan, in cooperation with other jurisdictions through the Lake Michigan Committee.
5. Aquatic Invertebrates [ER]
  - 5.1. Native mussel salvage operations initiated.
  - 5.2. Complete statewide data consolidation for existing records of native mussels and enter into NHI and the mussel atlas database.
  - 5.3. Implement the Hine's emerald dragonfly recovery plan; inventory potential habitat to locate additional populations.
  - 5.4. Assess the invertebrate community structure of macrohabitats defined in The Nature Conservancy's aquatic community classification system.
6. Terrestrial Invertebrates.
  - 6.1. Develop census for rare butterfly and moth species and implement the karner blue butterfly incidental take consultation process. [ER]
  - 6.2. Determine the rarity status of Wisconsin's terrestrial snail species through inventory and assessment.
  - 6.3. Characterize the insect species composition in prairie habitat through cooperation with the multi-state prairie insect inventory.

7. Rare Plants and Vegetative Communities [ER, WM]

- 7.1. Identify, designate, and manage State Natural Areas.
- 7.2. Locate and describe natural communities and rare plants present on and around state lands undergoing master planning.
- 7.3. Develop approaches for recovery planning for multiple species and/or species assemblages

**E. Commercial Activities [FH, LE]**

- 1. Manage for a stable commercial fishery within the productive capacity of Lake Michigan, Lake Superior, and the Mississippi River (see Lake Michigan Fishery Plan and Lake Superior plan for details).
- 2. In cooperation with the commercial fishing task force, develop an automated Great Lakes commercial fishing reporting system featuring immediate call in reporting by the licensee.
- 3. An emphasis is placed on enforcement, assessment, and management activities that regulate wild bait harvest, protection of fish and wildlife populations susceptible to commercialization.
- 4. Implement regulations concerning the harvest of native reptiles and amphibians. [ER, LE]

**F. Fish and Wildlife Health**

- 1. Focus fish and wildlife health assessments on perturbed ecosystems where toxicants or pathogens are the factors most likely contributing to the unsustainable system. [FH, WM]
- 2. By 2002 with the Department of Agriculture, Trade, and Consumer Protection, implement a statewide fish health protection system that assures the health of all fish stocked in Wisconsin waters. [FH]
- 3. Understand the causes and ecological factors controlling early mortality syndrome in Great Lakes salmonids. [FH]
- 4. Minimize the transmission of communicable diseases in Great Lakes salmonids. [FH]
- 5. Continue a strong program of disease monitoring, including surveillance of all significant species to detect changes in disease patterns and enhanced monitoring for emerging diseases such as TB and chronic wasting disease in deer. [WM]
- 6. Provide health management for reintroduction and conservation programs for endangered, threatened and rare species. [WM]
- 7. Investigate & manage disease risks at the captive wildlife/free-ranging population interface. [WM]
- 8. Continue contaminant monitoring in identified geographic areas of concern (e.g., snapping turtle, mink and tree swallow projects). [WM]

9. Monitor contaminant levels in urban goose populations to facilitate harvest for consumption as a population management alternative.

#### **G. Exotic and Invasive Species [ER, WM, LE]**

1. Prevent, control where feasible, or contain priority non-native invasive plant species.
  - 1.1. Priority species have been identified by site.
  - 1.2. Statewide invasive species management plans (including education, research & control) have been developed, approved and implemented.
2. Work toward control of harmful non-native animal species through 2007.
  - 2.1 Zebra mussel monitoring and containment strategy implemented.
  - 2.2 Mute swan reproduction is eliminated.
  - 2.3 The Aquatic Nuisance Species Plan is implemented.
3. Control native species or their populations that have been determined to be detrimental. Identify the populations, establish a target level, and reduce them to that level.

#### **H. Animal Damage [WM]**

1. Continue to implement the Wildlife Damage and Nuisance and Abatement program.
2. Implement Deer 2000 program changes to program as they become available.
3. Add eligibility for damage to agriculture caused by elk, wolves, and cranes as it becomes necessary.

### **III. HEALTH AND SAFETY**

#### **A. Contaminant Monitoring**

1. Monitor contaminant levels in fish by implementing the baseline monitoring strategy for lakes and streams in each GMU. Monitor contaminants in wildlife as directed through biennial guidance. [FH]
2. Increase public awareness of the health risks of consuming fish from 54% [of the 1998 sample] to 70% or more of the Wisconsin public by 2007 in partnership with the Department of Health. [FH]
3. Implement Total Maximum Daily Loads (TMDL's) where needed on impaired waters. [FH, WT]

#### **B. Recreational Accidents**

1. By 2005, reduce recreational accidents by 20% through enforcement, education and regulation changes. [LE]

#### **IV. OUTDOOR RECREATION GOALS AND OBJECTIVES**

##### **A. Major Sport Fish [FH]**

1. Improve sport fishing by protecting, maintaining and restoring critical habitat for natural sport fish stocks and their associated aquatic communities.
2. Provide a variety of fishing opportunities for experienced and novice anglers by managing for a variety of sport fisheries consistent with statewide guidelines and regulations categories.
3. To ensure that stocking provides a good return to the angler, implement the approved stocking guidelines in each GMU by 2001 to ensure that stocking provides a good return to the angler, is biologically sound, cost effective, and maintain the genetic integrity of naturally reproducing populations.
4. Accommodate a 4% to 7% expected increase in the number of anglers by 2007.
5. By 2001, implement the monitoring strategy in each basin to provide adequate information on the status and trends in the fishery and impact of management actions.
6. By 2002, review fishing regulations, identify those that do not significantly improve or protect a fishery, and eliminate them to simplify regulations.
7. In cooperation with Tourism and Law Enforcement, increase angler compliance with the requirement for a fishing license. [FH, LE]
8. Ensure that new regulations are accompanied by a communication & education plan [LE, FH]
9. Walleye: Implement 1998 statewide Walleye Management Plan (see plan for details).
10. Muskellunge
  - 10.1. Develop criteria to better define self-sustaining populations by 2001. Identify and protect those populations through 2007.
  - 10.2. Maintain a statewide catch rate of 24 hours per muskellunge through 2007.
  - 10.3. Develop and implement a comprehensive stocking evaluation by 2002 to improve the return of stocked fish to the angler.
  - 10.4. Increase trophy fishing opportunities for muskies >45-inches and double the catch rate of trophy muskie by 2007.
11. Inland Trout
  - 11.1. Simplifying the trout fishing regulations and revise the regulations booklet by 2001 [FH, LE].
  - 11.2. Implement an early trout season that is accepted by a majority of the public during the 2001-2007 time frame.
  - 11.3. Meet the desired management need of stocking 50% wild trout by 2002.

## 12. Great Lakes Sport Fish

- 12.1. Revise and gain public approval of the Lake Michigan Integrated Fisheries Plan by 2002.
- 12.2. Revise the Lake Superior fishery plan during the basin planning process.

## 13. Bass

- 13.1. Complete and gain approval for the statewide bass management plan by 2002 and implement in 2003.
- 13.2. Utilize tournament data and focus special monitoring activity on bass lakes and streams where they are major fisheries through 2007.

## 14. Pan fish: By 2005, review data and revise current regulations and management approaches through an approved pan fish management plan.

## 15. Sturgeon

- 15.1. Allow for sport harvest opportunities where a limited harvest can be sustained.
- 15.2. Implement the Lake Winnebago sturgeon management plan.

## 16. Catfish

- 16.1. Reduce flathead catfish harvest. (1) Manage it as trophy sport fish. (2) Evaluate the elimination of commercial flathead catfish harvest and report by Jan. 2002.
- 16.2. Make reporting of catch from all inland commercial gear required monthly by 2005.
- 16.3. Evaluate implementing a sport setline/bankpole license to allow personal use of this gear without commercial reporting and report by Jan. 1, 2002.

## **B. Major Wildlife Game Species [WM]**

- 1. Bear: Continue to gradually bring the bear population towards its goal of 10,900, through the use of liberal quotas when necessary. Continue to communicate with the Michigan DNR and the Minnesota DNR to perfect our population model and our survey method, and to keep abreast of the new modeling and surveying technology and techniques available. Institute annual or biennial bear training for new wildlife biologists or those who only recently began to see bears in their area.
- 2. Elk:

- 2.1. By 2006, and pending Natural Resources Board approval, there will be a healthy, growing population of elk numbering somewhere in the neighborhood of 200 to 500, and a hunting season either established or in the process of being created. A portion of these elk will be radio-collared to facilitate population monitoring, their winter browse utilization will be monitored, and any elk carcasses recovered will be screened for disease.
  - 2.2. Pending approval by the Natural Resources Board to retain the experimental elk herd at Clam Lake, implement the preferred alternative in the elk management plan to allow the herd to increase naturally, without supplemental stocking. The protocol for further elk releases in other locations throughout the state will be implemented. A definite population goal has not been established at this point, but a limited, bull-only hunt will be established prior to reaching the population goal. Monitoring of population size and health will continue, as will habitat monitoring. The Department recommends maintaining the current levels of young aspen growth through continued timber harvest. However, because most of the core elk range for the Clam Lake herd belongs to the US Forest Service, that agency will hold the ultimate authority for habitat management projects. The USFS is currently drafting a ten-year management plan, which will be released this spring.
3. Turkey: Expand and optimize spring and fall turkey hunting opportunities while maintaining high hunt quality and hunter satisfaction and strong safety record. Implement habitat management practices to meet objectives outlined in the wild turkey management plan using primarily turkey stamp revenues supplemented by SEG funds. Management practices to benefit turkeys include: prairie ecosystem establishment and management, oak savanna establishment and management, barrens management, oak-hickory ecotype management, hunter education, and population monitoring and population dynamics research.
4. Ring-necked pheasant: Expand pheasant hunting opportunities while improving hunt quality and hunter satisfaction. Implement habitat management practices to meet objectives outlined in the pheasant management plan using primarily pheasant stamp revenues supplemented by SEG funds. Management practices for pheasants include: prairie ecosystem establishment and management, CRP expansion and implementation, wetlands preservation and restoration, and population monitoring and population dynamics research. Continue to provide game farm pheasants for public hunting grounds, sports clubs, dog trialing clubs, dog training classes, and youth hunts.
5. Ruffed Grouse: Maintain high hunter interest in ruffed grouse hunting in Wisconsin. Implement habitat management practices to meet objectives outlined in the ruffed grouse management plan. Work with foresters, planners, county personnel and USFWS personnel to ensure that timber harvest remains a primary use (where feasible) of Wisconsin's forests.
6. Sharp-tailed grouse: Encourage implementation of the northwest barrens management plan to promote a core sharp-tailed grouse range there. Support identification of central Wisconsin core areas to maintain populations there. Implement habitat management practices to meet objectives outlined in the sharp-tailed grouse management plan. Continue to manage sharptail harvests at safe levels through a permit system.

7. Waterfowl: Continue to implement the objectives in the UMR&GLR Joint Venture including cooperation of "all bird objectives." This will be done by restoring and enhancing wetlands and upland cover important for ducks and other bird species. The key to our success will be working through partners to achieve the goals established in the Joint Venture. We will continue to funnel dollars through a non profit organization for waterfowl habitat work in Canada that achieves the objectives of our state waterfowl program. We will continue to work with the Flyway Council and FWS in the annual rule process to ensure that our annual regulations offer the optimize opportunities consistent with desired wildlife populations. We will do this by working with our constituents year long. We will initiate species research to address critical information needs. We will continue our spring waterfowl breeding waterfowl survey and enhance the procedure when applicable.
8. Geese: Continue to improve our Canada goose harvest management procedures to ensure we offer our hunters a simple system that meets the scientific and management needs. We will continue to work with the Flyway Council in monitoring the status of migrant birds and participate in collection of data to address critical information needs. We continue to monitor the status of Canada geese nesting/summering in the state and adjust hunting seasons as appropriate to maintain population at specified goals. We will work with local governments and individuals to address the problems they are having with injurious Canada geese.
9. Other Migratory Game Birds: Continue to enhance habitats for other hunted species of migratory birds, monitor their populations and adjust harvest consistent with those populations.
10. Beaver: Beaver populations throughout the state are healthy, yet not at crisis levels. Populations have been reduced by as much as 45% in northeastern Wisconsin; availability of Wildlife Services, USDA to counties and local townships has helped to reduce problems and protect habitat from valued trout streams to town roads to unique waters such as wild rice management areas. We will:
  - 10.1 Continue our three-year rotation of beaver population surveys in Zones A and B
  - 10.2 Secure funding for and develop a similar survey for the remainder of the state.
  - 10.3 Develop population goals for Beaver Management Zones A, B, and C.
  - 10.4 Begin to manage beaver as if they were considered valuable components of our forest ecosystems.
  - 10.5 Continue our beaver harvest survey with focus on obtaining additional information about densities, harvest pressure and pelt value trends.
11. While-Tailed Deer:
  - 11.1. Implement Deer Management for 2000 and Beyond Project Recommendations and aggressive harvest management strategies to lower the size of the deer population in most areas of the state.

- 11.2. The pre-hunt population of white-tailed deer in Wisconsin was estimated to be 1.7-million animals in 2000. This is substantially above the pre-hunt statewide goal of about 1.1 million deer. Over the next six years, we expect to expand the scope and magnitude of special seasons to include more DMU's each year across all areas of the state.
- 11.3. In the next six years, DMU reviews will be completed twice. Topics of consideration in DMU reviews include boundary changes and over-winter deer density goals.
- 11.4. Populations will continue to be monitored on a unit by unit basis including mandatory registration. Efforts will be made to improve the believability of this monitoring data and subsequent modeling outputs. Survey enhancements and models other than Sex-Age-Kill will be explored in greater detail during the next 6 years.
- 12. Achieve high levels of harvest reporting compliance to ensure sound scientific management programs. [LE]
- 13. By 2002, review hunting regulation, identify those that do not significantly improve or protect wildlife or public safety, and eliminate them to simplify regulations. [LE, WM]

**C. Watchable Fish, Wildlife, and Scenic Natural Habitat**

- 1. Increase 3rd through 5<sup>th</sup> grade student and teacher understanding and appreciation of Wisconsin fish, wildlife and other natural resources.
  - 1.1. All 1,600 Wisconsin public schools will receive at least one copy of a fish and wildlife education package and field trip guide to promote outdoor skills, ethics, and habitat related messages each year beginning in 2001. [FH, WM, LE, ER]
  - 1.2. Pre and post-tests will be administered to teachers taking workshops to learn how to use the Field Trip Guide to Wisconsin's Outdoors Classrooms by 2003. [ISS]
  - 1.3. Watchable Wildlife and fisheries programs will be promoted at teacher conferences each year for the next six years. [WM, FH]
- 2. Increase the availability and marketing of a variety of outdoor nature-based recreational opportunities to accommodate the continued increase in the number and types of outdoor recreation. [Additional funding required]
- 3. Establish an expanded recreational research program in the Department to form the basis for carrying out an expanded program to provide recreational opportunities to the public. [ER]
- 4. Participate in Bald Eagle Days and promote other eagle viewing opportunities. [ER]

#### **D. Managing User Conflicts**

1. Provide information to hunters and anglers on how their behavior affects other outdoor users through public service announcements, safety education programs, warden contacts, brochures and pamphlets. [LE, FH, WM]
2. Provide sufficient enforcement presence on water bodies and public lands to ensure that all users have the opportunity for a safe and enjoyable experience. [LE]
3. Assist municipalities to develop ordinances and management plans that ensure compatible use opportunities that are appropriate for the resources they have. [LE, FH, WM]
4. Develop and disseminate effective public awareness messages that are re-emphasized and repeated through multiple channels of communications within the Department. [LE]
5. Perform research into the causes of user conflicts [LE, ISS]
6. Solve the trespass issue through creative solutions in regulations. [LE]
7. Conduct an annual assessment of the impact of various types of recreation on the land. [ER]
8. Provide information to recreationists and land managers, redistribute use concentrations, and make greater use of volunteers to help alleviate problems. [ER]

#### **E. Access to Fish and Wildlife Opportunities [LF]**

1. Use 15% of the available Sport Fish Restoration plus state recreational Boating funds to acquire, develop and maintain access for fishing boats [see Adm. Code for standards]. Emphasize partnerships with local units of government (where we construct the boat ramp if they agree to maintain it) and compliance with ADA accessibility requirements. [FH, LF]
2. Use \$100,000 of SFR funds per year for shore fishing based access to serve non-boaters on inland lakes and rivers. [FM]
3. Develop, maintain and implement a statewide Six-Year Facilities plan for fisheries and wildlife properties, including boat access sites. Identify facilities and boat access needs within the GMU plans. [LF]
4. By 2002, implement an Internet site that provides comprehensive information on boat access sites. Expand the site to incorporate other access sites, fisheries and wildlife properties and facilities by 2003. [LF]
5. By 2003, we routinely use interest group task forces and partnership groups at the GMU level to help define reasonable access, appropriate development, and use of the properties and resources we manage. [LF]
6. Complete a plan for land acquisition, including fish and wildlife lands and state natural areas to support resource conservation and public outdoor recreation, covering the needs of the next 50 years and setting priorities for the period 2001-2010, by Sept. 2001. Implement efforts to meet the fish and wildlife goals of this plan each fiscal year from 2002 through 2006. [LF, WM, ER, FH]

7. By 2006, work with the Legislature and public to include a regular increase in the operating budget for DNR's fish and wildlife properties and state natural areas. [LF, WM, FH, LE]
8. By 2003, seek legislative approval and funding for a development, rebuilding and facilities maintenance program for DNR fish and wildlife properties to provide an adequate outdoor recreational infrastructure well into the next century. [LF, WM, FH]
9. By 2002, develop minimum property maintenance standards for fish, wildlife and other DNR properties, including basic infrastructure to support public use. [LF, WM, FH, ER]
10. Ensure that the hunting and angling public have equal access opportunity to the natural resource through enforcement and education. [LE]
11. Participate in public and private planning efforts to develop public use and recreation approaches that sustain ecosystems. [ER]
12. Increase opportunities across the state for a variety of quiet water and silent sports as appropriate for the property or water body. [ER]

#### **F. Fish Production System [FH]**

1. By 2003, gain legislative approval and funding for the rebuilding and continued maintenance of the fish production system and implement the long-term hatchery development plan to produce fish and serve as centers for public education and outreach. [FH, LF]
2. Operate and maintain the hatchery system as a flexible system of facilities that responds to quota requests developed for a 6 to 10 year horizon based on the 1999 revision of the stocking strategy and meets the projected long-term management needs for stocking healthy, high quality fish.
3. Use contract and cooperative agreements for species routinely produced by private aquaculture where it is cost effective and meets management needs for healthy fish and appropriate genetic strains.
4. Issue an annual report of stocking by state facility, species, size and strain of fish, and cost. Put the stocking database on-line by 2001.
5. Ensure the fish stocked in Wisconsin are healthy conduct diagnostic testing and annual health inspections at state hatcheries.
6. Use the best techniques available to prevent the transfer/transmission of fish pathogens and occurrence of fish diseases (vaccination, high quality diets, good water quality, improved hatchery practices).

**G. User satisfaction objectives:** Beginning in 2003, produce a report every two years to monitor trends in:

1. Angling, harvest of sport fish, and angler satisfaction, [ISS, FH]
2. Hunting, harvest of game species, and hunter satisfaction, [ISS, WM]
3. Use of DNR fish and wildlife properties and user satisfaction with the condition of the properties. [ISS, LF]
4. Satisfaction with the type and quantity of recreational opportunities and information related to non-game species and silent sports. [ISS, ER]

## PART II. ISSUES, STATUS, AND TRENDS

### **MAJOR STATEWIDE ISSUES**

1. **Habitat continues to be degraded, simplified, fragmented or destroyed by some land and water use practices, policies and development decisions.** Wisconsin's fish and wildlife, our continued enjoyment of hunting and fishing, our tourism industry and our quality of life depend on high quality natural habitat.
2. **Fish, wildlife, and their habitats are at risk because the system for funding management of these resources is outdated, inadequate, and unfair.** The large majority of funding for fish and wildlife management comes from user license fees. However, the growing demand for a broad array of fish and wildlife management services requires a broad funding source.
3. **More accessible, accurate, and timely information is needed to influence decisions which affect fish, wildlife and their habitats.** Wisconsin's resources should be managed with the best scientific information available to ensure that we can enjoy and protect these resources into the future.
4. **We do not have a good understanding of the public's vision and level of satisfaction for a wide range of wildlife related recreation.** We need to adequately understand, anticipate, and plan for what our diverse publics want today and in the future.
5. **Natural resources need protection from over use, abuse, and loss.** Conflicts among competing uses require resolution. Fish and wildlife populations and the habitat that supports them need protection.
6. **The DNR's ability to manage and protect lands has not kept pace with increases in its land ownership and number of approved acquisition projects.** The staff and financial resources available for protection and management of these lands have remained relatively constant while the Department's ownership has increased by 15% since 1990. These lands must be maintained to preserve the values that led to their purchase in the first place, and often need protection to prevent overuse and abuse. In addition, when new properties are established, the public's desire to use these properties can be very high and dissatisfaction can result from a lack of access and public use facilities.
7. **Much of the fish and wildlife habitat in Wisconsin is privately owned or affected by local regulations.** Federal, state, and local units of government need to work effective with private landowners to protect and manage natural resources.
8. **Participation in fishing and hunting has not kept pace with the state's population growth.** Hunters and anglers are the primary supporters of the DNR's fish and wildlife conservation programs. Declining participation threatens the ongoing protection of these resources and perhaps even the long-term viability of these recreational activities. Reasons for declining participation include inadequate public access, lack of readily available "how-to-get started" information, poor exposure and marketing of these activities, and competition by other activities for peoples' time.

9. **User expectations often exceed what the resource can provide on a sustainable basis.**  
Wisconsin residents participate in a growing variety of recreational activities. Growth in participation is not always at a level commensurate with available recreation resources. The growing popularity of motorized recreation, in particular, has created dissatisfaction among both motorized recreation participants and those affected by the growth in motor sports. Bigger and faster water craft put a strain on our waterways and shorelines and create a need for an increase in newer, larger boat landings.
10. **Contaminants make some fish and wildlife unsafe to eat and may have negative effects on some populations.**
11. **Invasive and exotic species have impacted and continue to threaten native species and habitats.**

### **STATUS AND TRENDS**

#### **HUMAN POPULATION**

##### **We expect a 14.57% increase in state population by 2025.**

Populations growth directly affects habitat and resource use. The more people the higher the incidents of conflict among users. More people also mean more competition for space and more development pressure on the resource.

#### HUMAN POPULATION GROWTH

	<b>1995</b>	<b>Est. 2000</b>	<b>Est. 2025</b>	<b>% INCREASE by 2025</b>
Wisconsin	5,121,000	5,250,000	5,867,000	14.57%

#### **FISHING:**

##### **We expect a 4% to 7% increase in the number licensed anglers by 2007.**

Actual license sales for the last ten years show that though sales vary from year to year, total angler numbers were steady through the 1990's at about 1.4-million licensed anglers. The University of Wisconsin and the Wisconsin State Demographer estimate that the number of anglers will increase by 4% to 7% between now and the year 2007. These estimates are based on the age profile for the state's population and participation rates by age cohort.

#### NUMBER OF LICENSED ANGLERS BY YEAR [millions]

1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
1.438	1.470	1.440	1.455	1.477	1.402	1.357	1.374	1.401	1.468

The number of Great Lakes salmon and trout anglers is expected to remain between 150,000 and 160,000. During the 1990's we saw an increase in the number of small mouth bass and perch anglers on Lake Michigan.

#### LICENSED GREAT LAKES SALMON ANGLERS BY YEAR [thousands]

1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
202	172	144	140	159	156	150	147	147	157

. Demand for inland trout fishing will remain stable at 130,000 anglers.

LICENSED TROUT ANGLERS BY YEAR [thousands]

1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
162	132	114	131	131	135	131	137	128	129

According to national survey estimates by the US Fish and Wildlife Service, licensed anglers spent 17.1 millions days fishing in Wisconsin and contributed over \$1-billion to the states economy in 1996. Changes in life styles have led to a decrease in the number of days that an average angler spends fishing each year from a high of 16 days per angler in 1985 to 14.5 days in 1991, and 12 days in 1996. Though specific data are not available, we believe that today's anglers are more effective than in the past because of better equipment and more information about where and how to fish. Public demands for stocking continue to increase, and stocking policies and practices need to be refined to make the most efficient use of hatchery-produced fish. A growing segment of anglers seeks trophy and catch and release fishing opportunities especially for premier sport fish (muskie, bass, and trout). Fishing regulations are a compromise of biology, sociology, and politics and are intended to improve fishing while protecting fish populations. There is growing participation in organized fishing tournaments, and growing public concern about their impacts.

#### HUNTING:

**We expect the number of hunters in Wisconsin to remain steady over the next 20 years.**

Actual license sales for the last 10 years show the number of hunters varied from a low of 730,000 in 1989 to a high of 813,000 in 1996. The higher figure in 1996 was due to a change in the way hunters were counted in that year and an early deadline for bonus permit sales. Stable numbers mean a smaller percentage of the population will be hunters as the population increases. The projection includes population growth and anticipated changes in the age and gender structure of Wisconsin's adult population.

NUMBER OF LICENSED HUNTERS BY YEAR (thousands)

1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
730	741	772	774	799	774	784	813	739	743

#### WILDLIFE WATCHING:

**We expect a 9% increase in the number of people who watch wildlife by activities by 2010.**

Nationwide data from the National Recreation Survey for the period between 1982 and 1995 shows that bird watching was the fastest growing outdoor recreation activity - far outstripping #2 which was hiking. It's estimated that currently about 46% or 1,771,000 of Wisconsin adults participate in bird watching or nature study activities. Participation in general wildlife viewing activities is also very popular, with an estimate of almost 60% or 2,274,000 of Wisconsin adults participating. Estimates for the year 2000 indicate that 2.087 million adults will participate in wildlife viewing and 1.292 million in nature photography.

BIRD WATCHING OR NATURE STUDY PARTICIPATION -  
WISCONSIN PROJECTIONS [millions]

1995	2000	2005	2010	2015	2020
1.855	1.787	1.859	1.925	1.977	2.010

In addition, significant increases in the number of people participating in a range of outdoor recreation activities are expected. These outdoor recreation activities depend upon and affect fish and wildlife resources.

Activity	Expected Increase by 2005
ATV Riding	8%
XC Skiing	4%
Day Hiking	7%
Jet Skiing	2%
RV Camping	6%
Snowmobiling	4%
Tent Camping	9%
Wildlife and Nature Photography	8%

#### **BOATING:**

**We expect a 5.7% increase in the number of people who participate in motor boating by 2010.** The number of motor boat registrations has increased by over 10% since 1990. Surveys indicate that an average of 40% of Wisconsin citizens participate in this activity each year, and this level of participation is expected to continue. In 2000, it is estimated that almost 1,569,000 people are involved in motor boating, and this is expected to rise to about 1,658,000 in 2010, a 5.7% increase (participation in canoeing, jet-skiing, and sailing are also expected to increase by 4.3%, 3.9% and 4.1%, respectively, over this period). Federal law requires that at least 15% of SFR funds granted to a state be used for the development, operation and maintenance of motor boat access sites. The Department has experienced an increase in the demand for access, and the trend toward higher land prices and larger water craft is resulting in greater acquisition and development costs.

#### **MOTOR BOATING PARTICIPATION – WISCONSIN PROJECTIONS (MILLIONS)**

1997	2000	2005	2010
1.531	1.569	1.616	1.658

#### **ACQUISITION OF FISH AND WILDLIFE PROPERTY:**

**The Department's approved acquisition goals are currently 195,683 acres (fee title and easement) for Fisheries properties and 633,096 acres (fee title and easement) for Wildlife properties.** Between July, 1990 and December, 1999, the Department purchased 27,070 acres (20,487 fee title and 6,583 easement) of Fisheries lands and 47,641 acres (43,567 fee title and 4,074 easement) of Wildlife lands.

The 50-year land acquisition plan will have substantial public involvement through public meetings, a Website, and opportunities for written comments. The input will consider the criteria to be used to identify lands that should be purchased and the actual areas of land that would be further evaluated after the study (e.g. through feasibility studies to establish new properties). DNR's acquisition goals are approved by the Natural Resources Board. For new properties, these acreage goals are set in a feasibility study that has substantial public involvement through meetings and several other opportunities for public comment. Changes in current acreage goals may be approved with limited public involvement (small changes in the goal/project boundaries) or through a feasibility study (major changes in goal/boundaries for the project).

#### **USE AND MAINTENANCE OF FISH AND WILDLIFE PROPERTIES:**

**With major increases in acres owned, and the establishment of many new properties over the past decade, the Department finds itself chronically short of the staff and fiscal resources needed to adequately manage and protect these lands.** In some instances, land management activities can be curtailed for a few years with limited long-term effects. However, in many cases vegetative succession, increases in the extent of invasive exotic species, or the level of public use demand that a property be maintained to an acceptable standard. In other situations, it may not even be evident to the public that they are on State lands, because there are no signs, boundaries are not clearly delineated, and facilities for public use are lacking. Besides land maintenance efforts, there also needs to be a law enforcement presence to help prevent abuse and over-use of public lands.

### **AQUATIC HABITAT AND COMMUNITY TRENDS**

(See Wisconsin's Biodiversity as a Management Issue report and the Natural Heritage Inventory for details. Refer to Wisconsin's State of Natural Resources Report for annual trends and performance reports.)

#### **WETLANDS:**

We expect a continued decline in the quality of our wetlands due to land use decisions, changes to water flows in and out of wetlands, and invasive species. The 1985 Wetland Inventory estimated that there are 5.3-million acres of Wisconsin wetlands which is 53% of the state's original wetland acreage. Over 75% of the wetlands are in private ownership. During the next 6 years we expect current protection, permitting, and restoration programs to hold the line against direct wetlands loss. We estimate a permitted loss of 312 acres per year based on a review of Corps of Engineers permits for 1991-1998. Illegal wetland fills add an unknown amount to this total. On the positive side, between 1992 and 1998 the Wetland Reserve Program, a voluntary program offered to land owners estimates that 11,312 acres of wetland have been restored or improved and an additional 11,312 acres of associated upland habitat has been protected on private lands. From 1990-1997 Department of Transportation road projects resulted in a loss of 1,299 acres of wetlands but were compensated by 1,903 acres of restoration, compensation and mitigation banking. Since 1992-1997, more than 50,000 acres of wetlands have been protected, restored, or managed and an additional 156,000 acres of uplands were managed to protect wetlands through the North American Waterfowl Management Plan.

#### **COLD WATER STREAMS:**

Wisconsin's 8,000 miles of cold water designated trout streams are protected by a number of habitat protection laws and regulations, but continue to be threatened by cranberry development, agricultural feed lots, uncontrolled cattle grazing, non-point runoff, and changing land use such as urban sprawl and construction site runoff. Quantity and quality of trout streams continue to improve in the southwest part of the state, allowing opportunities for increased brook trout management and restoration. Beaver problems have remained stable in the north, but must be continuously addressed on high priority waters.

#### **WARM WATER RIVERS AND STREAMS:**

Wisconsin's more than 30,000 miles of warm water rivers and streams are the most biologically diverse aquatic ecosystems we have, and the most threatened nationwide. The habitats found in these systems are reflections of their watersheds and it's many land uses. Modification of these rivers and streams and their landscapes have changed the character of these important systems. Warm water rivers and streams are the aquatic rain forests of Wisconsin. These systems harbor over 150 fish and 53 mussel species. About a third of the mussel species are endangered and threatened. More than 3,700 dams have been built on these rivers and 300-400 of these are obsolete and pose hazards to human safety, property, and the ecosystem. Though not appropriate in all situation, dam removal is the most important thing we can do to restore streams.

**LAKES:**

Wisconsin has 15,057 lakes totaling 982,155 acres. The majority of these lakes are small. About 3,620 lakes in Wisconsin are larger than 20 acres representing about 920,000 acres. Wisconsin lakes represent the heart of the U.S. distribution of the native range of both walleye and muskellunge, making these two species key components of the fish communities and fisheries of the larger lakes of the state. Degradation of near-shore and shoreline habitat is increasing with the pace of development, particularly in northern Wisconsin where, since 1960, two thirds of the larger lakes have been developed, the number of home sites has doubled, and the annual number of permits for sea wall construction has tripled. We now review and process over 10,000 permits for piers, near shore ponds, and structures each year. To protect shorelines, many counties are now enacting zoning standards for minimum lot sizes, riparian buffers, and minimum setbacks for buildings and other structures.

Fisheries community types in Wisconsin range from very small lakes with limited communities to a diverse range of centrarchid-panfish lakes (characterized by shallow - medium depths and littoral areas), esocid-panfish lakes (characterized by a range of sizes, shallow - medium depths, lots of littoral zone areas), to walleye-perch lakes (characterized by medium to large sizes, windswept shores, deeper depths).

**GREAT LAKES:**

Lake Michigan and Lake Superior provide fishing opportunities for over 150,000 sport anglers and 104 licensed commercial fishers. The commercial fishery for lake whitefish, lake trout, round whitefish, yellow perch, smelt, and bloater chubs lands 5 to 10 million pounds of fish annually. The sport fishery provides over 2.8 million hours of recreation each year. The major sport fish are coho salmon, chinook salmon, rainbow trout, brown trout, brook trout, lake trout, northern pike, smallmouth bass, yellow perch, and walleye. Sport and commercial harvests of individual species fluctuate from year to year, but continued overall vitality in the sport and commercial fisheries is expected.

As a signatory to "A Joint Strategic Plan for Management of Great Lakes Fisheries", the Wisconsin DNR is committed to working with other jurisdictions to develop fish community objectives for the two lakes, to identify habitats needed to allow the attainment of those objectives, and to support ecosystem management. The DNR participates in the Lake Michigan and Lake Superior Committees, multi-jurisdictional bodies that consider issues of common concern. In March, 2000, the Lake Michigan Committee will provide a report on progress toward achievement of the existing fish community objectives for Lake Michigan. The Lake Superior Committee is currently updating the fish community objectives for Lake Superior.

Specific fisheries management activities in Wisconsin waters of Lake Michigan are guided by the Lake Michigan Integrated Fisheries Management Plan. For Lake Superior, management activities are guided by the Lake Superior Basin Plan.

## **TERRESTRIAL HABITAT AND COMMUNITY TRENDS**

(See Wisconsin's Biodiversity as a Management Issue report and the Natural Heritage Inventory for details)

### **OAK AND PINE BARRENS:**

Less than 1% of the pre-settlement oak and pine barren habitat remains, and the long term sustainability of this habitat and the organisms that it supports will require that we protect and connect the existing scattered sites. Pine barrens originally covered 2.3-million acres of Wisconsin. Oak barrens covered 1.8-million acres in pre-settlement Wisconsin. Approximately 10,000 acres of good quality oak and pine barrens remain [ $<1\%$ ]. An additional 50,000 of oak and pine barren habitat exist in a degraded state as small, isolated fragments on a dozen state or federal lands. The composition, structure, and ecological function of this community depend on periodic fires as a management tool.

### **SOUTHERN FORESTS:**

Although the southern forest type is common, large, high-quality, unbroken tracts are becoming rare. Fragmentation and reduction will continue to increase. High quality woodlands are being lost to residential development. Other management issues contributing to loss of biodiversity associated with southern forests include the difficulty in using fire to maintain oak forests, the spread of oak wilt and the problem of exotic shrubs and herbs becoming dominant on some sites and the exotic eastern marten has been established in southeast Wisconsin. Poor management practices such as high-grading also continue to impact composition.

### **GRASSLANDS**

Original land survey records of the 1830's indicate there were 3.1 million acres of treeless grassland in Wisconsin or 9% of the total land cover. Tallgrass prairie and related oak savanna are now the most decimated and threatened plant communities in the Midwest and in the world. Wisconsin has only .5% (13,000 acres) of its original grassland ecosystem remaining in a relatively intact condition and much of this remnant acreage has been degraded to some degree by livestock grazing or woody invasion. Over 80% (11,000 acres) of this remaining acreage is sedge meadow and the rest (2,000 acres) is native prairie.

Recovering and maintaining native grassland biodiversity in Wisconsin is very feasible for many, but not for all components (e.g., birds, plants and invertebrates). Most remnants are too small for most vertebrate species but are capable of supporting viable populations of plant species. The greatest opportunities for recovery of degraded sites are at the dry and wet ends of the soil moisture spectrum, where several thousand acres of degraded dry prairie and sedge meadow still exist.

The Ecological Landscapes within Wisconsin which have opportunities to restore and preserve prairie are the Western Coulee, Western Prairies, Southwest Savanna, Southern Lake Michigan Coastal, Southeast Glacial Plains, and Central Sands Plains. Top priority landscapes for grassland restoration are: Thompson Prairie Grasslands, Muralt/Monroe Grasslands, Buena Vista/Leola Grasslands, White River Marsh Complex, Star Prairie Pothole Grasslands, Yellowstone/Pecatonica River Grasslands, and the Lower Wisconsin River Prairies and Barrens.

## **OAK SAVANNAH**

In the absence of active management, the future of oak savanna looks very bleak in Wisconsin and throughout its entire range. The recovery potential is substantial with active management. In the early mid-19<sup>th</sup> century, the oak savanna as an ecosystem was thoroughly fragmented and nearly totally destroyed throughout its range. It is one of the most threatened plant communities in the Midwest. Intact examples of oak savanna vegetation are now so rare that less than 500 acres are listed in the Natural Heritage Inventory as having a plant assemblage similar to the original oak savanna. This is less than 0.01% of the original 5.5 million acres. The increasing abandonment of lightly to moderately grazed wooded pastures and the accelerating succession of oak woodlots toward heavy shade producing trees and shrubs will lead to the decline and possible loss of much of what remains of the savanna flora and fauna, including eventual decline of the oaks themselves.

Threats to the future survival of oak savanna include the lack of knowledge about the community, the resistance to the prescribed use of fire, the lack of understanding of the importance of fire in maintaining oak savanna and increasing human population pressures.

There are, however, several opportunities to reverse the trend and increase existing oak savanna acreage by restoring large blocks of former savanna using intensive management regimes. Opportunities exist primarily in the Southeast Glacial Plains, Western Coulees and Ridges, and Southwest Savanna ecological landscapes....Kettle Moraine, Miss. River bluffs, Lower Chippewa uplands.

## **NORTHERN FOREST**

Both the species composition and relative proportion of pre-settlement forest types have been greatly altered by humans. However, considering the northern forest region as a whole, the overall species richness of plants and animals does not appear to be threatened. There is great potential for maintaining and enhancing biodiversity in the northern forest. The basic elements of the conservation of biodiversity in forests include tree species composition, stand age, stand structure and stand area to use a landscape approach that accounts for all the characteristic successional stages with forest stands ranging from small to very large. Many of the floral and fauna species are at the south and western edge of their range. The vegetative community changes markedly in crossing the tension zone to the south, where warmer climate prevails and to the west, where precipitation drops off in transition to prairie.

Early succession community species, such as aspen, are succeeding towards northern hardwood, white pine and balsam fir. Old growth communities are currently under-represented due to their recent origin at the turn of the century.